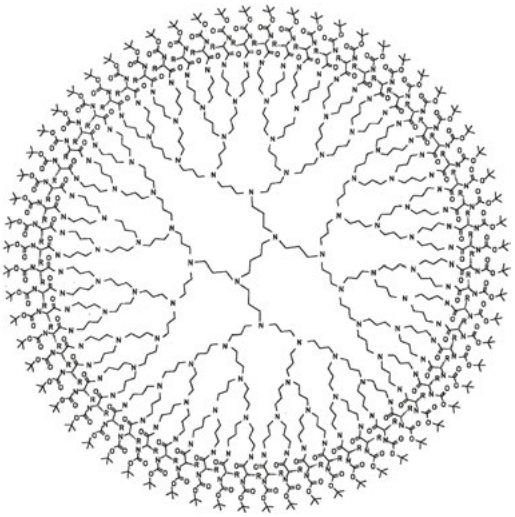
Nomenclature and terminology for dendrimers with regular dendrons and for hyperbranched polymers (IUPAC Recommendations 2017)

Fradet, A., Chen, J., Hellwich, K., *et al.*
Pure and Applied Chemistry, 2019
Volume 91, Issue 3, pp. 523-561



The present document provides recommendations for (i) definitions of terms related to dendrimers with regular dendrons and to hyperbranched polymers, and (ii) nomenclature for naming these complex compounds on the basis of structure-based nomenclature for regular and irregular organic polymers, including adjustments required for specifying dendritic and hyperbranched macromolecular structures. The recommendations and the examples deal with organic-chemical structures only. Nevertheless, the general principles described in this document can similarly be applied to inorganic and to hybrid inorganic-organic dendrimers and hyperbranched macromolecules.

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List of keywords for polymer science (IUPAC Technical Report)

Slomkowski, S., Fellows, C., Hiorns, R., *et al.*
Pure and Applied Chemistry, 2019
Volume 91, Issue 6, pp. 997-1027

Internet searches of scientific literature return results based mainly on electronic engines, which work to identify relevant keywords. These keywords are supplied by the authors of publications. The selection of keywords that best describe the content of a publication is therefore very important. Some publishers of journals related to polymer science provide a recommended list of keywords from which authors must select the most relevant terms. Wiley, for example does this. Some publishers, on the other hand, give authors license to provide their own keywords, while others provide a non-binding list of keywords, *i.e.* authors may use it or ignore it as they prefer. In addition to these variations, different authors place a different emphasis on the selection of keywords. Some take it as a serious exercise and strive to provide keywords that genuinely encapsulate the contents of their article, while others regard keywords as a nuisance and do not particularly care if they are a "low precision" guide to the content of their publication. Furthermore, as science is a dynamic discipline, newly discovered phenomena are constantly giving rise to new terms that may not be included in existing lists of keywords. All these factors introduce a degree of ambiguity which, in turn, makes searching the literature by keywords less accurate.

For these reasons it is worthwhile to collect the most salient terms from all areas of polymer science, *i.e.* polymer chemistry, polymer physics, polymer technology, and polymer properties, and then to assemble these terms into a representative list that may serve as an IUPAC-recommended list of keywords for polymer science. This is the aim of this paper. Ideally, all polymer-related journals would employ this list and would insist on authors selecting from it, except where terms are newly coined, in which event —if prudent—they would be added to the list, making it an evolving document. This would ultimately result in a streamlined search tool: faster, more comprehensive, and more accurate.

doi.org/10.1515/pac-2018-0917

Recent advances in analysis of trace elements in environmental samples by X-ray based techniques (IUPAC Technical Report)

Terzano, R., Denecke, M., Falkenberg, G., *et al.*
Pure and Applied Chemistry, 2019
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Trace elements analysis is a fundamental challenge in environmental sciences. Scientists measure trace elements in environmental media in order to assess the quality and safety of ecosystems and to quantify the burden of anthropogenic pollution. Among the available analytical techniques, X-ray based methods are

particularly powerful, as they can quantify trace elements in situ. Chemical extraction is not required, as is the case for many other analytical techniques. In the last few years, the potential for X-ray techniques to be applied in the environmental sciences has dramatically increased due to developments in laboratory instruments and synchrotron radiation facilities with improved sensitivity and spatial resolution. In this report, we summarize the principles of the X-ray based analytical techniques most frequently employed to study trace elements in environmental samples. We report on the most recent developments in laboratory and synchrotron techniques, as well as advances in instrumentation, with a special attention on X-ray sources, detectors, and optics. Lastly, we inform readers on recent applications of X-ray based analysis to different environmental matrices, such as soil, sediments, waters, wastes, living organisms, geological samples, and atmospheric particulate, and we report examples of sample preparation.

doi.org/10.1515/pac-2018-0605

Guidelines for unequivocal structural identification of compounds with biological activity of significance in food chemistry (IUPAC Technical Report)

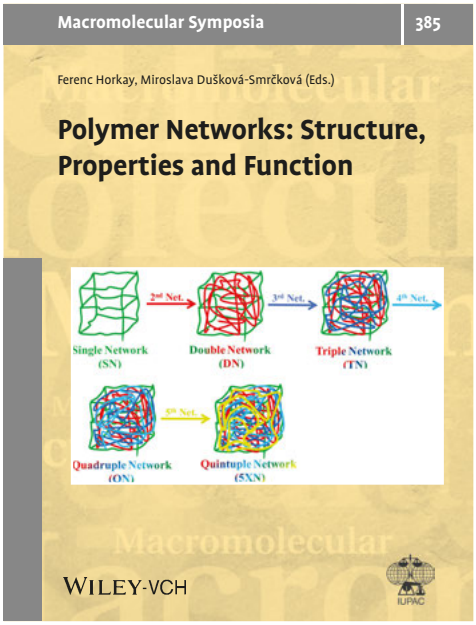
Molyneux, R., Beck, J., Colegate, S., *et al.*
Pure and Applied Chemistry, 2019
Volume 91, Issue 8, pp. 1417-1437

Isolation of endogenous constituents of foods is generally performed in order to elucidate the biological activity of individual compounds and their role with respect to factors such as organoleptic qualities, health and nutritional benefits, plant protection against herbivores, pathogens and competition, and presence of toxic constituents. However, unless such compounds are unequivocally defined with respect to structure and purity, any biological activity data will be compromised. Procedures are therefore proposed for comprehensive elucidation of food-based organic structures using modern spectroscopic and spectrometric techniques. Also included are guidelines for the experimental details and types of data that should be reported in order for subsequent investigators to repeat and validate the work. Because food chemistry usually involves interdisciplinary collaboration, the purpose is to inform chemists and scientists from different fields, such as biological sciences, of common standards for the type and quality of data to be presented in elucidating and reporting structures of biologically active food constituents. The guidelines are designed to be understandable to chemists and non-chemists alike. This will enable unambiguous identification of compounds and ensure that the biological activity is based on a secure structural chemistry foundation.

doi.org/10.1515/pac-2017-1204

Polymer Networks: Structure, Properties, and Function

Macromolecular Symposia Volume 385, June 2019



This volume of *Macromolecular Symposia* is based on papers presented at the Polymer Networks 2018 Conference, 17-21 June, 2018, Prague, Czech Republic. The conference was organized together with the 82nd Prague Meeting on Macromolecules by the Institute of Macromolecular Chemistry, Czech Academy of Sciences. The symposium provided an international forum to discuss recent advances and future prospects in the field of polymer networks and gels.

The present collection of papers provides an overview of research advances in several areas of polymer networks and gels as well as their applications. The topics range from new theoretical and experimental concepts to groundbreaking research in the laboratory, such as development of novel and efficient biopolymer materials for medical applications (drug delivery, wound healing, etc.). The design and fabrication of novel polymer compositions and architectures aimed at enhanced functional properties are emphasized in several contributions.

Extract reproduced from the Preface by Ferenc Horkay and Miroslava Dusková-Smrcková.

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